

(12) UK Patent Application (19) GB (11) 2 086 248 A

(21) Application No 8130146

(22) Date of filing 6 Oct 1981

(30) Priority data

(31) 3040923

(32) 30 Oct 1980

(33) Fed. Rep. of Germany (DE)

(43) Application published

12 May 1982

(51) INT CL³

B01F 5/00 15/04

(52) Domestic classification

B1C 121 122 2012 411

685 APB

(56) Documents cited

GB 1241985

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GB 572665

(58) Field of search

B1C

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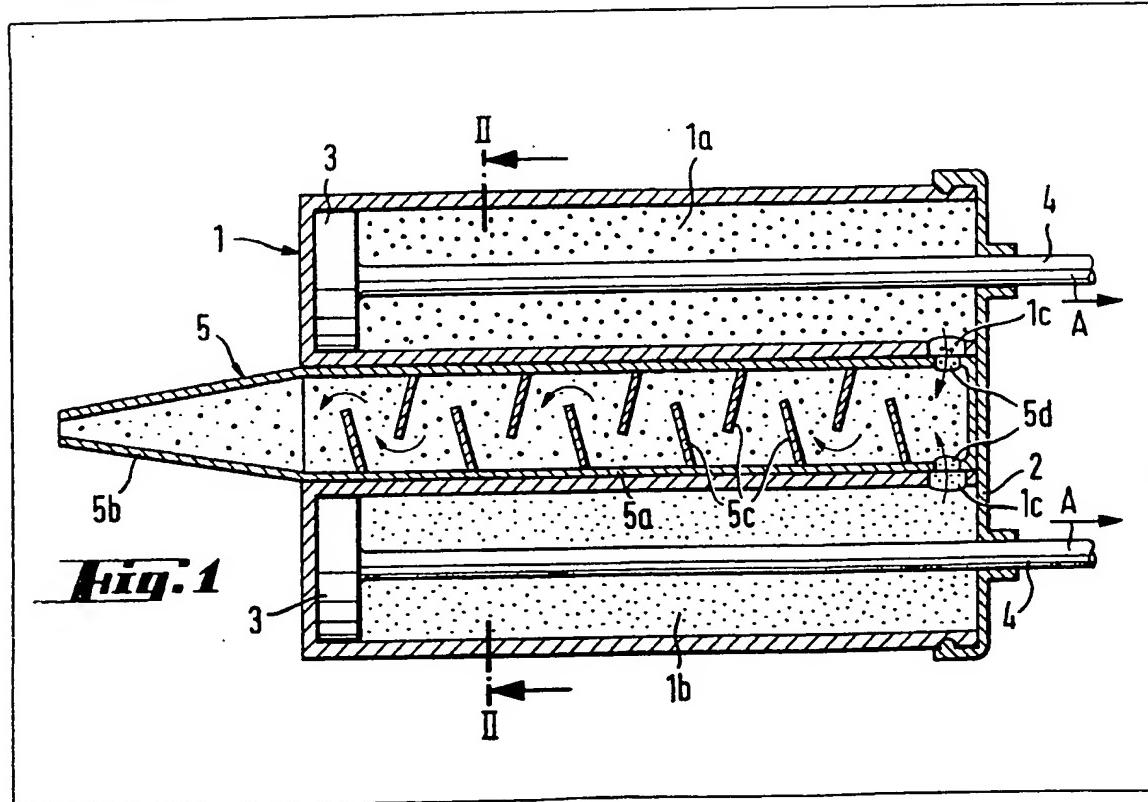
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(54) A tool for mixing and dispensing multi-component compositions

(57) A dispensing nozzle 5, of the tool, has a dispensing mouthpiece 56 and a mixing chamber 5a which lies within a storage container 1. The storage container 1 defines separate compartments 1a, b for the components of the composition. Pistons 3 in compartments 1a, 1b are

actuated to force the components from compartments 1a, 1b through respective apertures 1c, 5d into the mixing chamber. The compartments are parallel with the nozzle between them. Alternatively, the container is cylindrical with sector-like compartments divided by a partition of a surrounding bag. The bag is squeezed by a ring operated by gas pressure. The dividing wall supports the nozzle.



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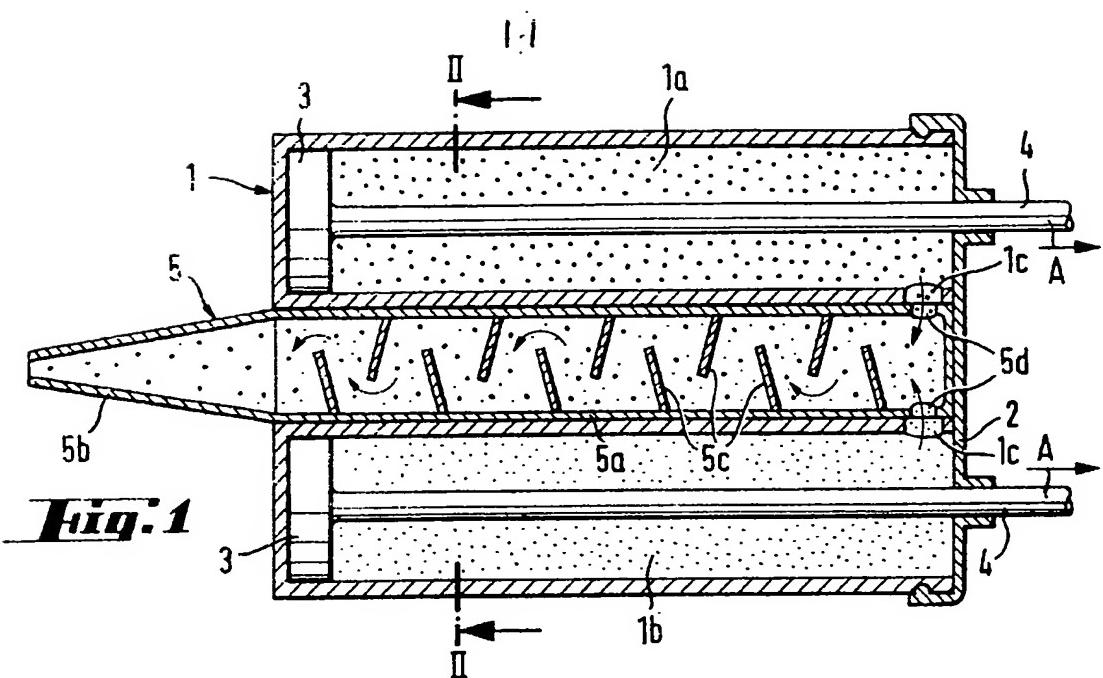


Fig. 1

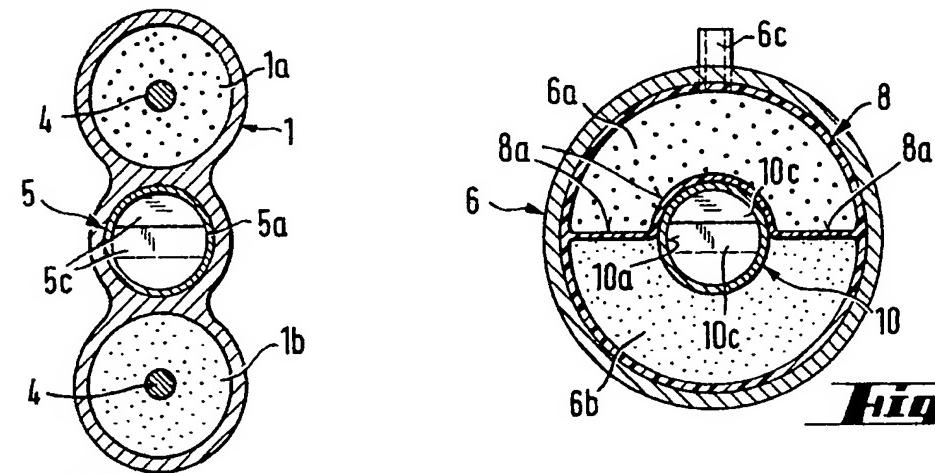


Fig. 2

Fig. 4

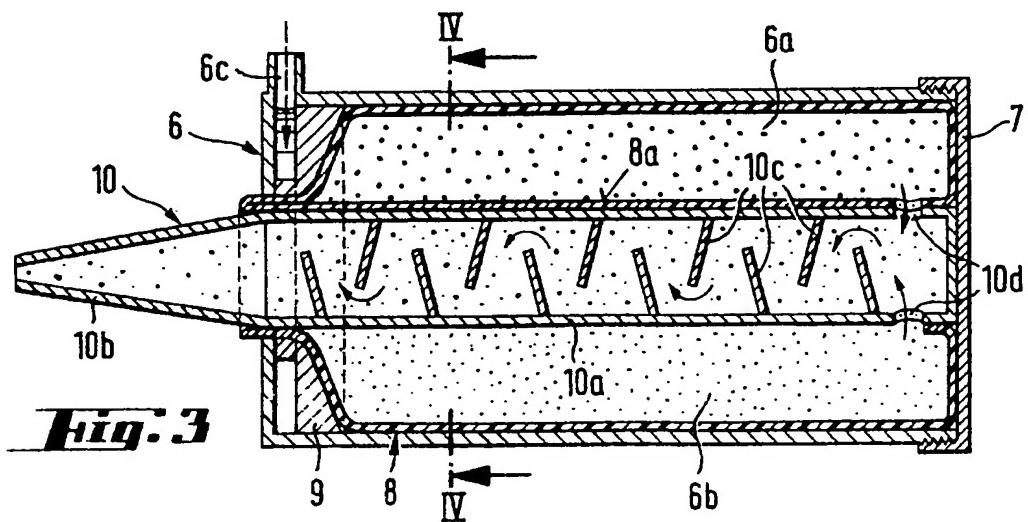


Fig. 3

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SPECIFICATION**A tool for mixing and dispensing multi-component compositions**

This invention relates to a tool for mixing and dispensing e.g. in dosed amounts, multi-component compositions such as adhesive, sealing compositions or filling compositions, such tool comprising a storage container having compartments for the separate storage of the components of the compositions, and a dispensing nozzle communicating with the storage container and having a mixing part, a mouthpiece communicating with the mixing part in a composition dispensing direction of the tool.

Various tools are known for processing multi-component compositions of a kind with which the present invention is concerned. In the simplest of these known tools the components are dispensed by the tool in dosed amounts and have to be mixed with one another by some separate means at the place of use, for example in a borehole. This procedure is very complex and, depending on the position and accessibility of the place in which the tool is used, it involves overcoming manifold problems. Moreover, an adequate mixing of the components is not guaranteed.

In another known tool, the components are mixed with one another in a storage container of the tool, this mixing entailing the destruction of dividing walls forming compartments in the storage container, and then dispensed in dosed amounts. This tool permits a good intermixing of the components. The essential disadvantage of this tool is that the various components have to be processed into the composition within the relatively short period of time.

Furthermore, it is known to feed the components, stored in separate compartments, to a dispensing nozzle which is associated with the tool. The dispensing nozzle usually consists of a mixing part and a mouthpiece which communicates with the mixing part in the composition dispensing direction of the tool. The mixing part contains baffle plates which serve to deflect the flow of the components and therefore bring about an intensive mixing of the components as they flow through the mixing part. This tool has proved successful in principle. One of its disadvantages is its very large overall length, which is brought about by the need for the dispensing nozzle to communicate with the storage container. Therefore the handling of this tool is made considerably more difficult.

An object of the invention is to provide a tool, for mixing and dispensing e.g. in dosed amounts, multi-component compositions, which has a compact construction and thereby has good handling characteristics.

In accordance with the present invention, this object is achieved in that the mixing part is arranged inside the storage container.

As a result of the arrangement of the mixing part inside the storage container, the overall length of the tool can be shortened considerably.

65 The compact construction of the tool facilitates its handling.

The mixing part can be arranged in any desired position inside the storage container. To achieve a mixing part having an overall length which is as great and thus effective as possible, it is advantageous for the mixing part to be arranged in axially-parallel manner with regard to the storage container. As a result of such an arrangement of the mixing part and the storage container the entire length of the storage container can act as a mixing path. This results in a good mixture of the components right up until the components emerge from the mouthpiece.

In order to permit a uniform and good supply of the components to the mixing part, it is advantageous for the mixing part to be arranged centrally inside the storage container. The central arrangement of the mixing part results in short connection paths between the mixing part and the compartments of the storage container. By the provision of cylindrical compartments of the storage container which are arranged parallel to one another, the mixing part may be arranged between the compartments. In the case of a cylindrical storage container, the mixing part may be arranged coaxially. The compartments of the storage container may then surround the mixing part in a sector-shaped manner.

As with known tools which are preferably intended to process the entire amount of composition all at once, in the tool of the present invention the wall of the mixing part advantageously forms part of the wall of the compartments of the storage container.

100 Since, when processing multi-component compositions, occasional interruptions in the working of the tool occur which last longer than the pot time, that is to say the time during which the mixed components are able to be processed, this can lead to the mixing part being rendered no longer capable of being used and therefore it has to be replaced. In such an event, in order to be able to process further the components still present in the compartments of the storage container, the wall of the mixing part is advantageously surrounded by the walls of the compartments of the storage container. As a result of this arrangement, to replace the mixing part it can simply be drawn out of the storage container and replaced by a new one.

115 The invention will be described further, by way of example, with reference to the accompanying drawings in which:

Fig. 1 is a longitudinal section illustrating a first preferred embodiment of the tool of the invention;

Fig. 2 is a section through the tool of Fig. 1, taken along the line II—II;

Fig. 3 is a longitudinal section illustrating a second preferred embodiment of the tool of the invention; and

Fig. 4 is a section through the tool of Fig. 3, taken along the line IV—IV.

Referring firstly to Figs. 1 and 2 the illustrated first embodiment of the tool conforming to the

invention for mixing and dispensing a multi-component composition comprises a storage container which is designated as a whole by the reference numeral 1. The storage container 1 contains, in two separate compartments 1a, 1b, respective components of a multi-component composition. The storage container 1 is closed at its rearward end by a lid 2. Pistons 3 are arranged respectively in the compartments 1a, 1b of the container 1. Each piston 3 is connected to a piston rod 4 to enable the piston 3 to be moved in the direction indicated by the arrows A by means of a respective transportation mechanism, connected to a respective piston rod 4, which is known 'per se' and which is therefore not shown. When the pistons 3 are moved in the direction indicated by the arrows A the components contained in the compartments 1a, 1b are expelled therefrom through outlet apertures 1c in respective walls of the compartments 1a, 1b.

A dispensing nozzle 5 is arranged between the compartments 1a, 1b. The dispensing nozzle 5 consists of a mixing part 5a and a mouthpiece 5b communicating with the mixing part 5a in a composition dispensing direction of the tool. The mixing part 5a is arranged inside the storage container 1 and is removable therefrom. In its rearward region, the mixing part 5a has inlet apertures 5d which are so arranged that when the mixing part 5 is pushed into the storage container 1 so that it butts against the lid 2 the apertures 5d can be aligned with the apertures 1c. This enables the components expelled from the compartments 1a, 1b to come into contact with one another in the mixing part 5a. The mixing part 5a contains baffle plates 5c which bring about a deflection of the component flow and thereby an extensive mixing of the components.

As shown in Fig. 2 the compartments 1a, 1b, of the storage container 7 lie side-by-side with the dispensing nozzle 5 lying therebetween. The baffle plates 5c are evident in the dispensing nozzle 5. The wall of the mixing part 5a is partially surrounded by a part of the walls of the compartments 1a, 1b, of the storage container 1.

Referring now to Figs. 3 and 4 the illustrated second embodiment of the tool conforming to the invention comprises a storage container which is circular in cross-section, which is designated as a whole by reference numeral 6 and which contains, in separate compartments 6a, 6b, components of a multi-component composition. Arranged in the storage container 6, which is closed at its rearward end by a lid 7, is a bag 8 made from a flexible material accommodating the components. The bag 8 has a dividing wall 8a which prevents premature contact of the two components. The wall 8a of the bag 8 extends over part of a wall of

a dispensing nozzle 10 which is arranged centrally in the storage container 6. The dispensing nozzle 10 comprises a mixing part 10a and a mouthpiece 10b communicating with the mixing part 10a in a composition dispensing direction of the tool. The mixing part 10a is therefore disposed in the compartment 6b inside the bag 8. The mixing part 10a serves, in this respect, on the one hand, as support for the dividing wall 8a and, on the other hand, as a part of the wall of the compartment 6b. The bag 8 can be squeezed with the aid of a squeezing ring 9 which is guided in the storage container 6. The actuation of the squeezing ring 9 may be effected, for example, by feeding a pressure medium such as compressed air or CO₂, in one end of the storage container 6. The components expelled from the bag 8 by the squeezing ring 9 pass through inlet apertures 10d into the mixing part 10a. In the mixing part 10a, the components are mixed together, upon flowing through, with the aid of baffle plates 10c contained therein.

Instead of a bag having a dividing wall 8a, however, also two or more bags separated from one another can be used, which bags surround the mixing part 10a in sector-shaped manner.

85 CLAIMS

1. A tool for mixing and dispensing e.g. in dosed amounts, multi-component compositions such as adhesive, sealing compositions or filling compositions, said tool comprising a storage container having compartments for the separate storage of the components of the compositions, and a dispensing nozzle communicating with the storage container and having a mixing part, a mouthpiece communicating with the mixing part in a composition dispensing direction of the tool, characterised in that the mixing part is arranged inside the storage container.
2. A tool as claimed in claim 1, characterised in that the mixing part is arranged in axially-parallel manner with regard to the storage container.
3. A tool as claimed in claim 1 or 2, characterised in that the mixing part is arranged centrally inside the storage container.
4. A tool as claimed in claim 1, 2 or 3, characterised in that a wall of the mixing part forms a part of a wall of the compartments of the storage container.
5. A tool as claimed in any preceding claim characterised in that a wall of the mixing part is surrounded by walls of the compartments of the storage container.
6. A tool for mixing and dispensing multi-component compositions substantially as hereinbefore described with reference to and as illustrated in Figs. 1 and 2, or in Figs. 3 and 4.